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EXAMINER

THOMPSON, CAMIE S

ART UNIT

PAPER NUMBER

1774

DATE MAILED: 05/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/830,897

Applicant(s)

KATHIRGAMANATHAN,
POOPATHY

Examiner

Camie S Thompson

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,6-9,11-14,16-21 and 23-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,6-9,11-14,16-21 and 23-27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

DETAILED ACTION

1. Applicant's amendment and accompanying remarks filed on February 20, 2003 has been acknowledged.
2. Examiner acknowledges amended claims 1, 8 and 23.
3. The objection to the specification is withdrawn due to applicant's amendment to the specification.
4. The rejection of claims 1, 6-9, 11-14, 16-21 and 23-27 under 35 U.S.C 112, second paragraph is withdrawn due to applicant's amended claims.

Claim Objections

5. Claim 1 is objected to because of the following informalities: Phenathroline is misspelled for the common name, bathophen. Appropriate correction is required.

Claim Rejections - 35 USC § 102

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

7. Claims 1 and 6 are rejected under 35 U.S.C. 102(b) as being anticipated by Dye et al., U.S. Patent Number 5,834,053.

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Dye discloses an organic, blue emitting material comprised of a tris-tetramethyl heptandionate ligand and a metal such as cerium, europium or terbium as per instant claims 1 and 6 (see abstract and column 3, lines 1-58). The reference discloses that europium and terbium can be used for other color emissions (see column 3, lines 8-9). The reference meets all the requirements set forth in claims 1 and 6 of the application.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 1, 8-9, 11-14, 16-21 and 23-27 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hu et al., U.S. Patent Number 5,923,363 in view of Moss, III et al., U.S. Patent Number 6,025,677.

Hu discloses an electroluminescent device that is comprised of a supporting transparent substrate a vacuum deposited organic hole-transporting layer, an organic light emitting layer, an electron-transporting layer and a cathode wherein the light-emitting metal chelate layer is vacuum deposited onto the hole-transporting layer as per instant claims 8, 11 and 16 (see column 3, lines 13-23). The Hu reference also discloses that the transparent substrate comprises a conductive glass that acts as the anode as per instant claim 9 (see column 3, lines 13-15). Additionally, the reference also discloses that the organic hole-transporting layer is comprised of an aromatic

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tertiary amine such as N,N'-diphenyl-N,N'-bis(3-methylphenyl)-1,1'-biphenyl-4,4' diamine as per instant claims 13-14 and 26-27 (see column 3, line 17 and column 7, line 56-column 8, line 4). The embodiment of an light-emitting layer comprising a metal chelate composition, a fluorescent dye and a hole-electron recombination material (electron injection material) is provided by Hu in column 3, line 65-column 4, line 15 as per instant claims 17, 20-21 and 25. Hu discloses that the electron injecting material is comprised of 1,3,4-oxadiazole chelate compound as per instant claim 18 (see column 3, lines 6-11).

The reference does not disclose the metal chelate compound as described in instant claim 1.

Moss, III teaches an electroluminescent device including a glass substrate wherein an organic complex of a metal and an organic ligand is deposited onto the substrate as per instant claims 1 and 8 (see column 4, lines 9-51). It would have been obvious to one of ordinary skill in the art to use the organic light-emitting complex of Moss, III in the electroluminescent device of Hu in order to obtain blue light emission (see Moss, III reference: column 2, line 66-column 3, line 5).

Neither reference discloses ratio amount of hole-transporting material to electroluminescent material. However, the amounts of the hole-transporting material and the electroluminescent material is optimizable. Discovery of optimum values of a result effective variable involves only routine skill in the art in re Boesch, 617 F.2d 272, 205 USPQ 215 (CCPA 1980). It would have been obvious to one of ordinary skill in the art to have the hole-transporting material mixed with the electroluminescent material in a ration of 5-95% of electroluminescent material to 95 to 5% of the hole-transporting compound as this is an optimizable feature. The amount of the hole-transporting material and the electroluminescent material each control the emission and luminescence of the device.

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10. Claims 1, 8 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kawamura et al., U.S. Patent Number 6,074,734 in view of Moss, III et al., U.S. Patent Number 6,025,677.

Kawamura discloses an organic electroluminescence device that comprises a substrate layer that acts as the anode, a light-emitting layer that comprises an electroluminescent compound and a cathode as per instant claim 8 (see column 1, lines 27-68). The reference also discloses that the layer of the light-emitting zone may have a laminate structure having two or more layers as per instant claim 24 (see column 38, line 66-column 39, line 1).

The reference does not disclose the light-emitting compound as described in instant claim 1. Moss, III teaches an electroluminescent device including a glass substrate wherein an organic complex of a metal and an organic ligand is deposited onto the substrate as per instant claims 1 and 8 (see column 4, lines 9-51). It would have been obvious to one of ordinary skill in the art to use the organic light-emitting complex of Moss, III in the electroluminescent device of Hu in order to obtain blue light emission (see Moss, III reference: column 2, line 66-column 3, line 5).

Response to Arguments

11. Applicant's arguments filed February 20, 2003 have been fully considered but they are not persuasive. Applicant argues that the Dye reference does not teach blue emitting material with cerium (III), europium or terbium with TMHD. The Dye reference teaches in column 3, lines 5-8 that cerium is the preferred activator dopant for blue emission. Although the Dye reference specifically teaches cerium tetrakis-tetramethyl heptandionate, it does not exclude cerium (III). The reference simply states that cerium serves as the activator dopant. It would

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have been obvious to use cerium (III) because cerium has been shown to create the blue color. There is a reasonable expectation of success that the cerium (III) would work equally similar to the cerium (IV) since they are the same material and would be expected to act in a similar manner absent a showing of unexpected results. Additionally, applicant's claim 6 discloses europium (II) (TMHD)₂. Claim 6 is dependent upon claim 1 which discloses that the electroluminescent compound emits a blue or purplish blue spectrum. It has been previously taught in the Dye reference that europium as an activator dopant can yield other color emissions than blue emission. The Dye reference and applicant use the same material. Therefore, applicant's claim of blue emission from europium (II) (TMHD)₂ contradicts previously taught europium (II) (TMHD)₂ as emitting a color other than blue in the Dye reference.

Applicant argues that the Hu, Moss III or the Kawamura references teach the instantly claimed invention. The Moss III reference teaches that cerium creates the blue color. Although the Moss III reference does specifically teach cerium IV, it does not exclude cerium III. The Moss III reference states in column 3, lines 1-5 that depositing a cerium activated alkaline earth thiogallate onto a substrate can create blue phosphor emission. The reference does not state whether or not the cerium is +3 or +4. It has been shown in the prior art that cerium creates blue color emission. There is a reasonable expectation of success that the cerium +3 would work similarly to the cerium +4 since they are the same material and would be expected to act in a similar manner absent a showing of unexpected results. Additionally, the Hu and Kawamura reference teach luminescent compounds in electroluminescent devices. Therefore, Hu, Kawamura and Moss III are analogous art. In order to obtain blue color emission, it would have

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been obvious to use the cerium-activated alkaline earth thiogallate phosphor of the Moss reference with Hu or Kawamura since the cerium compounds are known to emit blue light.

In view of the response, the rejections are maintained.

12. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communication from the examiner should be directed to Camie S. Thompson whose telephone number is (703) 305-4488. The examiner can normally be reached on Monday through Friday from 7:30 am to 4:00 pm. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Cynthia H. Kelly, can be reached at (703) 308-0449. The fax phone numbers for the Group are (703) 872-9310 {before finals} and (703) 872-9311 {after finals}.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

CYNTHIA H. KELLY
SUPERVISORY PATENT EXAMINER
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Cynthia H. Kelly